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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/642,154	08/21/2000	Steve Duncan	0054-0219P-SP	7758
7590 08/15/2005 Birch Stewart Kolasch & Birch LLP P O Box 747 Falls Church, VA 22040-0747			EXAMINER TSE, YOUNG TOI	
			ART UNIT 2637	PAPER NUMBER

DATE MAILED: 08/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/642,154

Applicant(s)

DUNCAN, STEVE

Examiner

YOUNG T. TSE

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2005 and 15 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-7 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7 and 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings were received on May 09, 2005. These drawings are acceptable.
2. The drawings are objected to because the beginning boundary of the second Ng shown in Figure 2 is not labeled. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 1-3, 5-7 and 13-15 are objected to because of the following informalities: in claim 1, lines 1 and 8, "synchronisation" should be "synchronization" and line 7, "absolute values" should be "the absolute values". Claims 2-3, 5-7 and 13-15 are directly or indirectly depended upon claim 1. Appropriate correction is required.

Allowable Subject Matter

4. The indicated allowability of claims 1-3, 5-7 and 13-16 in the previews Office Action is withdrawn in view of the newly discovered reference(s) to Karim et al.. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 5-7 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable by Karim et al.

Karim et al. (U.S. Patent No. 6,501,810) discloses a receiver circuit in Figure 3 comprising A/D converters 301 and 303 for converting analog OFDM complex components from a receiver front end (not Shown) to OFDM complex samples, an FFT transformer 305, a differential demodulator 307, a synchronizer 309, a de-interleaver

313, a channel decoder, and a PAC receiver 317. The detailed discussion of Figure 3 is explained in col. 4, lines 31-49.

Figure 4 shows the detailed embodiment of the synchronizer 309 of Figure 3 including a comparator 404 for comparing the input and output OFDM frame pointers p1 and p2, a memory 406, a digital filter 408, a modulo integrator 410, an adjustable amplifier 412, an adjustable threshold 416, and a synchronization pulse generator 414. The detailed discussion of the synchronizer 309 is discussed in col. 4, line 62 to col. 5, line 53.

Figure 5 shows the flowchart operation of the synchronizer 309 of Figure 4. The operation of the flowchart is discussed in col. 5, line 54 to col. 6, line 37.

With respect to claim 16, the A/D converters 301 and 303 corresponds to the device for receiving the OFDM signal from the receiver front end including useful symbol periods separated by guard spaces, with data in each guard space corresponding to part of the data in a respective useful symbol period (see Figure 2); the comparator 404, the memory 406, the digital filter 408, the modulo integrator 410, the adjustable amplifier 412, and the adjustable threshold 416 correspond to the first circuit for determining and monitoring the difference between absolute values p1 and p2 of the OFDM samples separated by a period corresponding to the useful symbol period; and the synchronization pulse generator 414 corresponds to the second circuit for generating a the synchronization pulse in response to the first circuit detecting a substantial change in the difference between the absolute values (see col. 6, lines 9-

12). Notice the claimed subject matter of the method claim 1 is similar to the claimed subject matter of the apparatus claim 16 discussed above.

Although Karim does not explicitly show or suggest the step of providing the difference between the absolute values to an edge detector as recited in claim 1 and the first circuit formed by an edge detector, as mentioned in Figure 4 above, a digital filter 408 is used within the synchronizer 309 which is a lead/lag filter to smooth variable arrival time of p1 and predict the next time position of p2 (col. 5, lines 23—25).

Obviously, a lead/lag digital filter is capable of correcting trailing/falling edge of signals, inherently the lead/lag digital filter corresponds to the edge detector for performing the same function(s) as recited in claims 1 and 16. Therefore, it would have been obvious to one of ordinary skill in the art to use an edge detector or the digital filter 408 in the synchronizer 309 as a lead/lag digital filter in order to detect or smooth the difference of the absolute values from the comparator 404 prior the generation of the synchronization pulse by the synchronization pulse generator 414.

With respect to claim 2, the integrated values are further obtained over a plurality of symbol periods by, for instance, the modulo integrator 410.

With respect to claim 3, the modulo integrator 410 includes an IIR filter is well known to one skilled in the art as admitted by Applicant in the Remarks on page 8.

With respect to claims 5-6 and 13-14, the digital filter 408 has variable coefficients. See col. 5, lines 26-30.

With respect to claim 7, a finite impulse response (FIR) filter is one kind of digital filters, therefore, it would have been obvious to one skilled in the art to use FIR filter in the digital filter 408.

With respect to claim 15, as shown in Figure 3 of the receiver circuit, the OFDM complex samples are Fourier Transformed and demodulated by the FFT 305 and the differential demodulator 307.

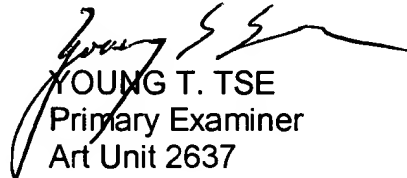
Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Marshall discloses a multi-level correlation system for detecting symbols and data frame synchronization.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOUNG T. TSE whose telephone number is (571) 272-30513051. The examiner can normally be reached on Monday-Thursday and alternative Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The Central FAX Number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


YOUNG T. TSE
Primary Examiner
Art Unit 2637